

**WHAT IS CLAIMED IS:**

1. A casing drilling system for monitoring a characteristic of a reservoir surrounding a borehole, comprising:  
a casing drilling assembly having a drill bit for drilling a borehole;  
5 a casing tubular coupled to the casing drilling assembly, the casing tubular disposed within the borehole, the casing tubular including at least one station having at least one slot formed therein;  
at least one antenna or sensor, adapted for transmission and/or reception of a signal, disposed within the casing tubular and positioned such that the antenna  
10 or sensor is aligned with the at least one slotted station; and  
means for activating the at least one antenna or sensor to transmit and/or receive a signal.
2. The system of claim 1, wherein the reservoir characteristic is resistivity.  
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3. The system of claim 1, wherein at least one slot is formed at the at least one station such that the slot is sloped at an angle with respect to the longitudinal axis of the casing tubular.
- 20 4. The system of claim 1, wherein the transmitted or received signal consists of electromagnetic energy.
5. The system of claim 1, wherein the at least one antenna or sensor is permanently or temporarily disposed within the casing tubular.
- 25 6. The system of claim 1, wherein a first signal is transmitted from the at least one aligned antenna and a second signal is received at a location remote from the transmitting antenna, or  
a first signal is transmitted from a remote location and a second signal is received  
30 at the at least one aligned antenna or sensor; wherein

the received signal is associated with the transmitted signal.

- 5 7. The system of claim 1, wherein the at least one antenna or sensor is mounted on a well tool, the tool being adapted for deployment with the casing drilling assembly.
8. The system of claim 7, the tool further comprising means to centralize the tool within the casing tubular and/or means to provide a conductive path between the tool and the casing tubular.
- 10 9. The system of claim 1, wherein the at least one slotted station comprises isolation means to provide hydraulic isolation at the at least one slot.
10. A casing drilling system for monitoring a characteristic of a reservoir surrounding a borehole, comprising:
- 15 means for making an opening in a wall of a casing tubular disposed within the borehole, the means being adapted for deployment through the tubular to a desired location in the tubular; and
- a casing drilling assembly having a drill bit for drilling a borehole;
- 20 a casing tubular coupled to the casing drilling assembly, the casing tubular disposed within the borehole, the casing tubular including at least one station having at least one slot formed therein;
- at least one antenna or sensor, adapted for transmission and/or reception of a signal, disposed within the casing tubular and positioned such that the antenna
- 25 or sensor is aligned with the at least one slotted station; and
- means for activating the at least one antenna or sensor to transmit and/or receive a signal.
11. The system of claim 10, wherein the transmitted or received signal consists of
- 30 electromagnetic energy.

12. The system of claim 10, the tool further comprising means to provide a conductive path between the tool and the tubular.
- 5 13. A method for monitoring during a drilling operation a characteristic of a reservoir surrounding a borehole, comprising:
- a) disposing a casing tubular within the borehole, the casing tubular including at least one station having at least one slot formed therein;
  - b) disposing at least one antenna within the casing tubular, each at least one  
10 antenna adapted to transmit or receive a signal;
  - c) aligning the at least one antenna with at least one slotted station within the casing tubular;
  - d) locking the casing tubular to a casing drilling apparatus, maintaining alignment with the antenna and the slotted station;
  - 15 e) commence a drilling operation; and
  - f) transmitting, during the drilling operation, a first signal from the at least one aligned antenna and receiving a second signal associated with the transmitted signal.
- 20 14. The method of claim 13, wherein the reservoir characteristic is resistivity.
15. The method of claim 13, wherein the first and second signals of steps (d) consist of electromagnetic energy.
- 25 16. The method of claim 13, further comprising:
- (e) determining the phase and/or amplitude of the received signal.
17. The method of claim 16, further comprising:
- (f) relating the determined phase and/or amplitude to corresponding reservoir  
30 resistivities; and

(g) relating the corresponding reservoir resistivities to reservoir oil saturations.

18. The method of claim 13, further comprising:  
e) processing the received signal of step (d).
19. The method of claim 18, wherein step (e) includes using a theoretical model to determine the reservoir characteristic.
20. A method for monitoring during drilling operations a characteristic of a reservoir surrounding a borehole, the borehole having a casing tubular disposed therein, comprising:  
a) inserting into the casing tubular a means for making an opening in a wall of the casing tubular;  
b) making at least one opening at a desired location in the wall of the casing tubular; and  
c) disposing at least one antenna within the casing tubular, each at least one antenna adapted to transmit or receive a signal;  
d) aligning the at least one antenna with the at least one opening within the casing tubular;  
e) locking the casing tubular to a casing drilling apparatus, maintaining alignment of the antenna and the opening;  
f) commence a drilling operation; and  
g) transmitting, during the drilling operation, a first signal from the at least one aligned antenna and receiving a second signal associated with the transmitted signal.
21. The method of claim 20, wherein the reservoir characteristic is resistivity.
22. The method of claim 20, wherein the transmitted or received signal of step (c) consists of electromagnetic energy.

23. The method of claim 20, further comprising:  
h) determining the phase and/or amplitude of the received signal.

5 24. The method of claim 23, further comprising:  
(i) relating the determined phase and/or amplitude to corresponding reservoir resistivities; and  
(j) relating the corresponding reservoir resistivities to reservoir oil saturations.

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